Multi-Disciplinary Forest Fire Danger Assessment in Europe
The Potential to Integrate Long-Term Multi-Scale Drought Information

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Outline

Motivation: forestry and drought collaboration

Methodology: correlation of fires and drought

Results:
- burnt areas undergo long-term dry conditions
- drought information has an added value

Conclusions: move on to the next step of collaboration
European Forest Fire Information System (EFFIS)

EFFIS provides:

- Information on wildfires in Europe
- Support for the protection of forests
- Current and historical data on the fire situation

http://effis.jrc.ec.europa.eu/
European Drought Observatory (EDO)

EDO provides:

- Continental overview information on droughts
- Visualization and analysis
- Seamless access to regional and national drought information in Europe

http://edo.jrc.ec.europa.eu
Steps in the Assessment of a Potential Collaboration

1. Define hypothesis
2. Design and perform research study
3. Assess added value of including complementary information
Hypothesis

Fire Danger Levels: precipitation of the last 24 hours considered

EFFIS + EDO = ?

Standardized Precipitation Index (SPI): accumulated precipitation over several timescales
Research Study

- Study area: Iberian Peninsula
- Input data:
  - Burnt areas of 2009
  - Fire Danger Levels
  - Standard Precipitation Index (SPI) for 1, 3, 6, 9, 12 and 24 months
Standardized Precipitation Index

- Meteorological drought index comparing accumulated precipitation to local long-term mean values
- Assessment of drought conditions on various time scales ranging from 1 to 24 months
- Seven classes between extremely wet and extremely dry conditions
Research Study cont.

1. Evaluation of relationship between forest fire occurrence and drought conditions
   - Assessment of drought conditions of burnt areas
   - Comparison of conditions in burnt areas in respect to whole study area

2. Comparison of fire danger levels of EFFIS with SPI-24 drought index for identifying added value of drought information
Result 1 – Drought Conditions in Burnt Areas

![Bar chart showing drought conditions for different SPI timescales (SPI1, SPI3, SPI6, SPI9, SPI12, SPI24). The chart displays the percentage of burnt area in 2009 classified according to SPI conditions (extremely wet, very wet, wet, nearly normal, moderately dry, severe dry, extremely dry).]
Result 2 – SPI-24 in Burnt Areas and Whole Study Area
Result 3 – Comparison of Fire Danger and SPI-24 in Burnt Areas
Summary of Results

Hypothesis verified:
- We found a relationship between burnt areas and regions with low 24-month accumulated precipitation totals

Added value given:
- SPI-24 could serve as complementary information outside the forest fire season for forest fire risk assessment
Conclusions

Design of research study:

1. Define hypothesis
2. Design and perform research study
3. Assess added value of including complementary information

Assessment of a potential collaboration successful
Future Work

Research specific issues:

- Extended analysis over several years
- Development of a real-time system considering drought information in forest risk assessment

General direction of future work:

Continue with developing a collaboration framework between EFFIS and EDO
Thank you for your attention!
Comments? Questions?

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<table>
<thead>
<tr>
<th>SPI Value</th>
<th>Class</th>
<th>Cumulative Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPI ≥ 2.00</td>
<td>Extreme wet</td>
<td>0.977 – 1.000</td>
</tr>
<tr>
<td>1.50 &lt; SPI ≤ 2.00</td>
<td>Severe wet</td>
<td>0.933 – 0.977</td>
</tr>
<tr>
<td>1.00 &lt; SPI ≤ 1.50</td>
<td>Moderate wet</td>
<td>0.841 – 0.933</td>
</tr>
<tr>
<td>-1.00 &lt; SPI ≤ 1.00</td>
<td>Near normal</td>
<td>0.159 – 0.841</td>
</tr>
<tr>
<td>-1.50 &lt; SPI ≤ -1.00</td>
<td>Moderate dry</td>
<td>0.067 – 0.159</td>
</tr>
<tr>
<td>-2.00 &lt; SPI ≤ -1.50</td>
<td>Severe dry</td>
<td>0.023 – 0.067</td>
</tr>
<tr>
<td>SPI &lt; -2.00</td>
<td>Extreme dry</td>
<td>0.000 – 0.023</td>
</tr>
</tbody>
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